29. The microactuator of Claim 25 further comprising a rotatable member overlying the substrate, the second electrostatic drive member being coupled to the rotatable member for driving the rotatable member about an axis of rotation extending perpendicular to the substrate.

30. The microactuator of Claim 29 wherein the first and second springs each extend radially from the axis of rotation.

31. An electrostatic microactuator comprising a substantially planar substrate, at least one comb drive assembly having first and second comb drive members, the first comb drive member being mounted on the substrate, first and second spaced-apart springs, each spring having a first end portion coupled to the substrate and a second end portion coupled to the second comb drive member for suspending the second comb drive member over the substrate, each of the first and second comb drive members being provided with a plurality of comb drive fingers, each of the comb drive fingers having a proximal portion with a width and a distal portion with a width less than the width of the proximal portion, the second comb drive member being movable relative to the first comb drive member from a rest position in which the distal portions of the comb drive fingers of the first and second comb drive members are interdigitated to an actuated position in which the distal portions of the comb drive fingers of the second comb drive member are interdigitated with the proximal portions of the comb drive fingers of the first comb drive member and the distal portions of the comb drive fingers of the first comb drive member are interdigitated with the proximal portions of the comb drive fingers of the second comb drive member.

32. The microactuator of Claim 31 further comprising a rotatable member overlying the substrate, the second comb drive member being coupled to the rotatable member for driving the rotatable member about an axis of rotation extending perpendicular to the substrate.

33. The microactuator of Claim 32 wherein the first and second springs each extend radially from the axis of rotation.

34. The microactuator of Claim 32 wherein the at least one comb drive assembly includes a plurality of comb drive assemblies, the rotatable member, the plurality of comb drive assemblies and the first and second springs when viewed together in plan having the shape of a fan.

35. The microactuator of Claim 34 wherein the rotatable member, the plurality of comb drive assemblies and the first and second springs when viewed together in plan subtend an angle of approximately 180° or less about the axis of rotation.

36. An electrostatic microactuator comprising a substantially planar substrate, a rotatable member overlying the substrate for rotation about an axis of rotation extending perpendicular to the substrate, at least one electrostatic drive assembly extending substantially radially from the axis of rotation and having first and second electrostatic drive members, the first electrostatic drive member being mounted on the substrate and the second electrostatic drive member being coupled to the rotatable member, and not more than first and second spaced-apart springs, each spring having a first end portion coupled to the substrate and a second end portion coupled to the second electrostatic drive member for suspending the second electrostatic drive member and the rotatable member over the substrate, the second electrostatic drive member being movable in a direction of travel about the axis of rotation between first and second positions relative to the first electrostatic drive member.

37. The microactuator of Claim 36 wherein the at least one electrostatic drive assembly is disposed between the first and second spaced-apart springs.

38. The microactuator of Claim 36 wherein each of the first and second electrostatic drive members is a comb drive member provided with comb drive fingers.

39. The microactuator of Claim 38 wherein the second comb drive member is movable relative to the first comb drive member from a first position in which the comb drive fingers of the first and second comb drive members are not substantially fully interdigitated to a second position in which the comb drive fingers of the first and second comb drive members are substantially fully interdigitated.

40. The microactuator of Claim 36 wherein the first and second springs each extend radially from the axis of rotation.

41. The microactuator of Claim 36 further comprising a movable structure overlying the substrate, the movable structure including the rotatable member and the second electrostatic drive member and having a center mass at the axis of rotation for inhibiting undesirable movement of the movable structure in response to externally applied accelerations to the microactuator.

42. A micromechanical device comprising a substantially planar substrate, a rotatable member overlying the substrate for rotation about an axis of rotation extending perpendicular to the substrate, not more than first and second spaced-apart springs, each spring having a first end portion coupled to the substrate and a second end portion coupled to the rotatable member for suspending the rotatable member over the substrate, and a micromotor carried by the substrate and coupled to the rotatable member for driving the rotatable member about the axis of rotation between first and second positions relative to the substrate.

43. The device of Claim 42 wherein the first and second springs each extend radially from the axis of rotation.

44. The device of Claim 42 wherein the micromotor is disposed between the first and second spaced-apart springs.

45. An electrostatic microactuator comprising a substantially planar substrate, a rotatable member overlying the substrate for rotation about an axis of rotation extending perpendicular to the substrate, a plurality of electrostatic drive assemblies extending substantially radially from the axis of rotation, each of the plurality of electrostatic drive assemblies having a first electrostatic drive member mounted on the substrate and a second electrostatic drive member coupled to the rotatable member, and first and second spaced-apart springs, each spring having a first end portion coupled to the substrate and a second end portion coupled to the second electrostatic drive member for suspending the second electrostatic drive member and the rotatable member over the substrate, each second electrostatic drive member being movable in a direction of travel about the axis of rotation between first and second positions relative to the respective first electrostatic drive member, the rotatable member, the plurality of electrostatic drive assemblies and the first and second springs when viewed together in plan having the shape of a fan.

46. The microactuator of Claim 45 wherein the rotatable member, the plurality of electrostatic drive assemblies and the first and second springs subtend an angle of approximately 180° or less about the axis of rotation.

47. The microactuator of Claim 46 wherein the rotatable member, the plurality of electrostatic drive assemblies and the first and second springs subtend an angle of approximately 90° about the axis of rotation.

48. The microactuator of Claim 45 wherein each of the first and second electrostatic drive members is a comb drive member having comb drive fingers.

49. The microactuator of Claim 48 wherein the comb drive fingers of the first and second comb drive members are not substantially fully interdigitated when in the first and position and the comb drive fingers of the first and second comb drive members are substantially fully interdigitated when in the second position.

50. The microactuator of Claim 45 wherein the first and second springs each extend radially from the axis of rotation.

51. An electrostatic microactuator comprising a substantially planar substrate, a rotatable member overlying the substrate for rotation about an axis of rotation extending perpendicular to the substrate, a plurality of comb drive assemblies extending substantially radially from the axis of rotation, each of the plurality of comb drive assemblies having a first comb drive member mounted on the substrate and a second comb drive member coupled to the rotatable member, and first and second spaced-apart springs, each spring having a first end portion coupled to the substrate and a second end portion coupled to the second comb drive member for suspending the second comb drive member and the rotatable member over the substrate, each of the first and second comb drive members being provided with comb drive fingers, the comb drive fingers of the second comb drive member having respective distal ends which extend along an imaginary line that does not intersect the axis of rotation.

52. The microactuator of Claim 51 wherein the comb drive fingers of the first comb drive member having respective distal ends which extend along an imaginary line that does not intersect the axis of rotation.

53. The microactuator of Claim 51 wherein the second comb drive member is movable relative to the first comb drive member from a first position in which the comb drive fingers of the first and second comb drive members are not substantially fully interdigitated to a second position in which the comb drive fingers of the first and second comb drive members are substantially fully interdigitated.

54. The microactuator of Claim 51 wherein the first and second springs each extend radially from the axis of rotation.

55. The microactuator of Claim 51 wherein the rotatable member, the plurality of comb drive assemblies and the first and second springs when viewed together in plan have the shape of a fan.

56. The microactuator of Claim 55 wherein the rotatable member, the plurality of comb drive assemblies and the first and second springs when viewed together in plan subtend an angle of approximately 180° or less about the axis of rotation.

57. An electrostatic microactuator comprising a substantially planar substrate, a rotatable member overlying the substrate for rotation about an axis of rotation extending perpendicular to the substrate, first and second linear micromotors and a first coupler for securing the first linear micromotor to the rotatable member and a second coupler for securing the second micromotor to the rotatable member for rotating the rotatable member about the axis of rotation.

58. The microactuator of Claim 57 wherein the axis of rotation extends through the rotatable member.

59. The microactuator of Claim 57 wherein each of the micromotors is an electrostatic micromotor having at least one comb drive assembly.

60. The microactuator of Claim 57 wherein the first and second couplers comprise first and second coupling springs.

61. The microactuator of Claim 57 wherein the first and second micromotors are symmetrically disposed about the rotatable member.

62. The microactuator of Claim 57 wherein the direction of linear travel of the first micromotor is parallel to the direction of linear travel of the second micromotor.

63. A microelectromechanical device comprising a microelectronic substrate having a surface, a movable member disposed above the surface of the substrate and having an axis of rotation extending therethrough, first and second micromechanical actuators capable of imparting translational motion carried by the substrate and first and second couplers for coupling the movable member to the respective first and second micromechanical actuators, the first and second couplers being joined to the movable member at a distance spaced from the axis of

rotation whereby translational motion imparted by the first and second micromechanical actuators on the first and second couplers causes rotation of the movable member about the axis.

64. The device of Claim 63 wherein each of the first and second micromechanical actuators is an electrostatic microactuator.

65. The device of Claim 63 further comprising an optical member carried by the movable member.

66. An electrostatic microactuator comprising a substantially planar substrate, a rotatable member overlying the substrate for rotation about an axis of rotation extending perpendicular to the substrate, at least one electrostatic drive assembly having first and second electrostatic drive members, the first electrostatic drive member being mounted on the substrate and the second electrostatic drive member being coupled to the rotatable member, first and second spaced-apart folded springs, each folded spring having a first spring member coupled to a second spring member, each of the first and second spring members extending radially of the axis of rotation, each first spring member having an end portion coupled to the substrate and each second spring member having an end portion coupled to the second electrostatic drive member for suspending the second electrostatic drive member and the rotatable member over the substrate, the second electrostatic drive member being movable about the axis of rotation between first and second positions relative to the first electrostatic drive member.

67. The microactuator of Claim 66 further comprising a connector overlying the substrate, each of the first spring members having an additional end portion coupled to the connector.

68. The microactuator of Claim 67 wherein the additional end portions are coupled to the connector adjacent the axis of rotation.

69. The microactuator of Claim 66 wherein each of the first and second electrostatic drive members is a comb drive member having comb drive fingers, the second comb drive member being movable relative to the first comb drive member from a first position in which the comb drive fingers of the first and second comb drive members are not substantially fully interdigitated to a second position in which the comb drive fingers of the first and second comb drive members are substantially fully interdigitated.

70. The microactuator of Claim 66 wherein the at least one electrostatic drive assembly includes a plurality of electrostatic drive assemblies, the rotatable member, the plurality of electrostatic drive assemblies and the first and second springs when viewed together in plan having the shape of a fan.

71. The microactuator of Claim 70 wherein the rotatable member, the plurality of electrostatic drive assemblies and the first and second springs when viewed together in plan subtend an angle of approximately 180° or less about the axis of rotation.

72. An electrostatic microactuator comprising a substantially planar substrate, a rotatable member overlying the substrate for rotation about an axis of rotation extending perpendicular to the substrate, a plurality of first spring members extending radially of the axis of rotation and a plurality of second spring members extending radially of the axis of rotation, a connector overlying the substrate, each first spring member having a first end portion coupled to the substrate and a second end portion coupled to the connector, each second spring member having a first end portion coupled to the connector and a second end portion coupled to the rotatable member for suspending the rotatable member over the substrate, the rotatable member being movable about the axis of rotation between first and second positions relative to the substrate.

73. The microactuator of Claim 72 further comprising at least one comb drive assembly having first and second comb drive members, the first comb drive member being mounted on the substrate and the second comb drive member being coupled to the rotatable member for driving the rotatable member about the axis of rotation.

74. The microactuator of Claim 73 wherein the at least one comb drive assembly has an outer periphery, the first end portion of each first spring member being coupled to the substrate near the outer periphery and the second end portion of each second spring member being coupled to the second comb drive member near the outer periphery, the second end portion of each first spring member and the first end portion of each second spring member being coupled to the connector near the axis of rotation.

75. The microactuator of Claim 73 wherein each of the first and second comb drive members has comb drive fingers, the second comb drive member being movable relative to the

first comb drive member from a first position in which the comb drive fingers of the first and second comb drive members are not substantially fully interdigitated to a second position in which the comb drive fingers of the first and second comb drive members are substantially fully interdigitated.

76. The microactuator of Claim 73 wherein the at least one comb drive assembly includes a plurality of comb drive assemblies, the rotatable member, the plurality of comb drive assemblies and the first and second springs when viewed together in plan having the shape of a fan.

77. The microactuator of Claim 76 wherein the at least one comb drive assembly includes a plurality of comb drive assemblies, the rotatable member, the plurality of comb drive assemblies and the first and second springs when viewed together in plan subtend an angle of approximately 180° or less about the axis of rotation.

78. A micromechanical device comprising a substrate, at least one connector overlying the substrate, a plurality of first beam-like springs coupling the at least one connector to the substrate, a movable member overlying the substrate for rotation about an axis of rotation extending perpendicular to the substrate, a plurality of second beam-like springs coupling the movable member to the at least one connector, each of the first and second beam-like springs extending substantially radially of the axis of rotation.

79. The device of Claim 78 wherein the at least one connector is arcuate and extends at least partially around the axis of rotation.

80. The device of Claim 78 wherein the movable member is a platform.

81. The device of Claim 78 further comprising a micromotor carried by the substrate and coupled to the movable member for driving the movable member about the axis of rotation.

82. A micromechanical device comprising a substrate, a movable structure overlying the substrate for rotation about an axis of rotation, a stationary structure formed on the substrate, a connector overlying the substrate, a first flexure member coupling the connector to the stationary structure and a second flexure member coupling the movable structure to the connector, each of the first and second flexure members extending substantially radially from the center of rotation.

83. The device of Claim 82 wherein the connector extends at least partially around the axis of rotation.

84. The device of Claim 82 wherein the movable structure is fanlike in shape when viewed in plan.

85. The device of Claim 82 further comprising a micromotor carried by the substrate and coupled to the movable member for driving the movable member about the axis of rotation.

86. A micromechanical device comprising a substantially planar substrate, a stationary structure mounted on the substrate, a movable structure overlying the substrate for rotation about an axis of rotation and not more that first and second flexure members extending substantially radially of the axis of rotation, each of the first and second flexure members having a first end portion coupled to the stationary structure at the axis of rotation and a second end portion coupled to the movable structure.

87. The device of Claim 86 wherein the at least one flexure member includes first and second flexure members, each of the first and second flexure members having a first end portion coupled to the stationary structure at the axis of rotation and a second end portion coupled to the movable structure, the first and second flexure members extending substantially radially from the axis of rotation at an angle to each other.

88. The device of Claim 86 further comprising a micromotor carried by the substrate and coupled to the movable member for driving the movable member about the axis of rotation.

89. The device of Claim 88 wherein the micromotor is an electrostatic microactuator.

90. The device of Claim 86 wherein the movable structure is fanlike in shape when viewed in plan.

91. A micromechanical device comprising a substantially planar substrate, a rotatable member overlying the substrate for rotation about an axis of rotation extending perpendicular to the substrate, the rotatable member having a central aperture through which the axis of rotation extends and a micromotor carried by the substrate and coupled to the rotatable member for driving the rotatable member about the axis of rotation whereby the central aperture permits the passage of light therethrough.

92. The device of Claim 91 wherein the micromotor includes a plurality of comb drive assemblies extending substantially radially from the axis of rotation, each of the plurality of comb drive assemblies having a first comb drive member mounted on the substrate and a second comb drive member coupled to the rotatable member, and first and second spaced-apart springs, each spring having a first end portion coupled to the substrate and a second end portion coupled to the second comb drive member for suspending the second comb drive member and the rotatable member over the substrate, each second comb drive member being movable in a direction of travel about the axis of rotation between first and second positions relative to the respective first comb drive member.

93. The device of Claim 92 wherein the first and second springs each extend radially from the axis of rotation.

94. The device of Claim 91 wherein the rotatable member is a ring.

95. The device of Claim 94 further comprising a half wave plate disposed in the aperture of the ring.--

REMARKS

This Preliminary Amendment should be considered before examination of this continuation application.

Attached hereto is a marked-up version of the title and claims showing the changes made thereto by this Preliminary Amendment. That attached page is captioned "Version with Markings to Show Changes."

Respectfully submitted,

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